Study Purpose

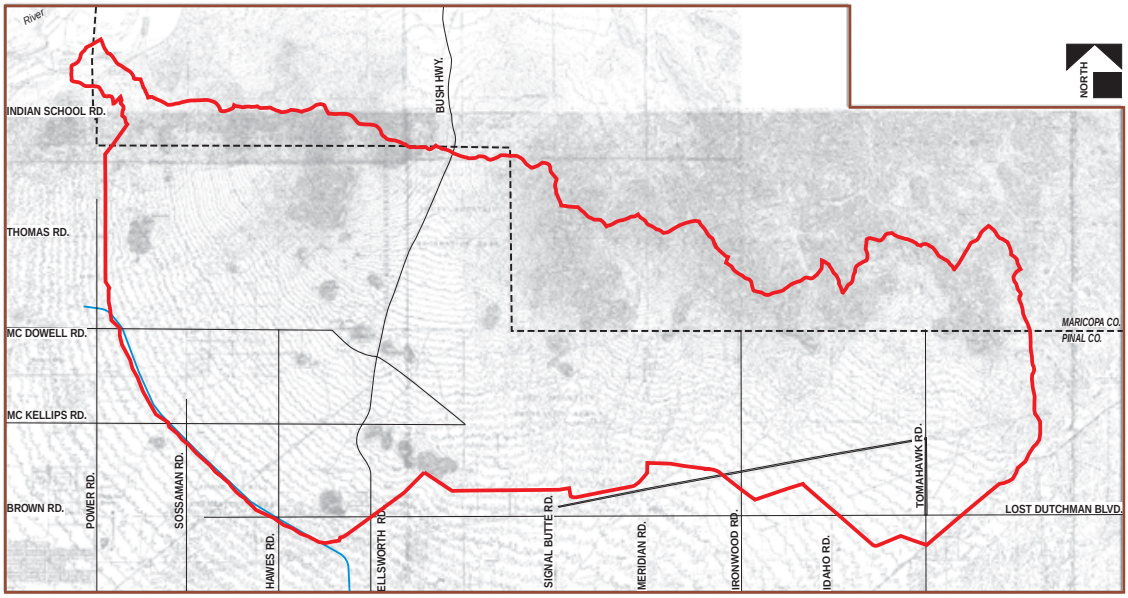
The Flood Control District (District) of Maricopa County is developing an update to an Area Drainage Master Plan (ADMP) for the Spook Hill area of eastern Maricopa County. The purpose of the ADMP is to identify drainage problems and develop a plan that will mitigate them. The purpose of the Spook Hill ADMP is to revise the existing 1987 Spook Hill Area Drainage Master Study by identifying current drainage problems and developing cost-effective solutions for a storm water collection and disposal system. The Spook Hill ADMP Update will:

- identify and evaluate existing regional and neighborhood drainage problems;
- consider neighborhood character and community recreational needs;
- evaluate archaeological, biological, and other environmental influences;
- identify cost-effective drainage solutions that provide maximum community benefits; and
- involve the community and the stakeholders in the development of the plan.

Study Goals

- **To develop a plan to manage runoff and minimize flood damage within the watershed.**
- **To protect lands within the study area from the future 100-year flood damage.**

Study Location



Study Progress

The Spook Hill ADMP Update study team has completed the data collection, existing conditions hydrologic modeling, and the Level I (Alternatives Formulation) Phase since the last public information meeting held in January 2000. During the Level I (Alternatives Formulation) Phase, two brainstorming meetings were held with various stakeholders for the project including City of Mesa staff and various other governmental agency staff. In addition, to ensure that the original design intent of the Flood Retarding Structures (FRS) is followed, the study team has extensively researched the original SCS (Soil Conservation Service - now the Natural Resource Conservation Service) design of the Buckhorn - Mesa structures. The alternatives that are developed will maintain the level of protection provided by the existing FRS structures.

Data Collection

A summary of environmental considerations including: community needs and public opinion, existing biological and cultural resources, visual and landscape character, existing and proposed development, zoning, existing and proposed multiple-use trails, and park facilities in the study area has been completed.

Hydrologic Modeling

In order to determine the amount of runoff generated by the watershed during a 100-year storm event, the study team developed an existing conditions Hydrologic model for the entire Buckhorn-Mesa watershed (the watershed contributing to the Apache Junction FRS, Signal Butte FRS, and Spook Hill FRS). This model was used as a basis to determine the effectiveness of the various alternatives evaluated during the Level I (Alternatives Formulation) Phase of the project. During the Level II (Alternative Development) Phase, detailed hydrologic models will be developed for each of the selected Level I (Alternative Formulation) alternatives.

Level One Analysis

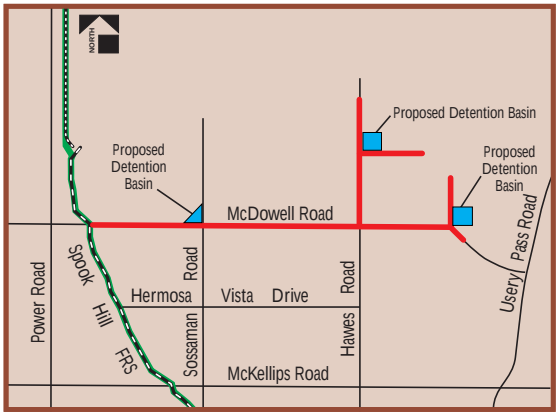
Analysis of all the collected data allowed the study team to develop and evaluate numerous potential drainage solutions/options. Two formal brainstorming meetings were conducted with the stakeholders, and public input was invited in the development of the alternatives. The study team has given the potential drainage solutions/options an initial evaluation to identify any fatal flows and will present them to the community through a second public meeting for additional suggestions and ideas.

Preliminary Alternatives

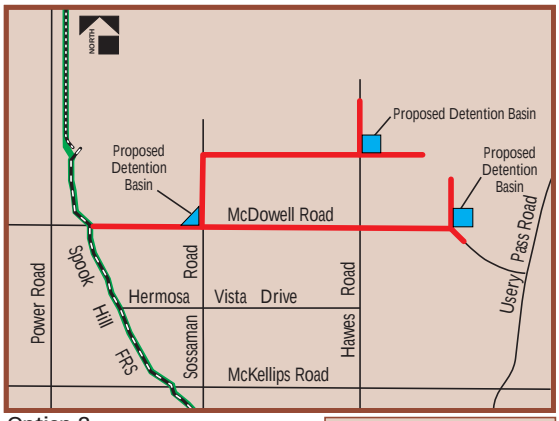
Evaluation of the environmental and visual resources, analysis of the hydrologic models, and assessment of the multiple-use opportunities in the study area led the study team to focus on five alternative planning areas. These areas are referred to as the McDowell Road Alternative, McKellips Road Alternative, Culver Street Alternative, Pass Mountain Alternative, and Non-jurisdictional Alternative. The study team spent the past several months developing and evaluating potential drainage solutions for each alternative planning area. The options development and evaluation focused on designing cost-effective regional drainage solutions that are sensitive to the natural and cultural resources, enhance the neighborhood's character, and are acceptable to the community. All proposed options will safely convey the 100-year storm event (a storm that has a 1% chance of occurring any given year), and compliment regionally planned trails and recreational facilities. The potential drainage alternatives for each alternative planning area are further previewed in this newsletter. Each preliminary alternative is described on the following pages in terms of a specified goal, its advantages and disadvantages, and any options that may be relevant.

For each of the alternative planning areas, several types of construction (as well as No Action and Non-Structural) options were considered. The No Action option is included to evaluate the merits of leaving the watershed in its current condition. The purpose of the Non-Structural option is to address the drainage concerns within the watershed without any physical modifications/improvements within the watershed. Examples of Non-Structural implementation are education, flood insurance, and early warning. Although a large number of alternatives were evaluated as part of the Level I (Alternatives Formulation) Phase of the project, only the alternatives selected to proceed to Level II (Alternative Development) Phase have been presented in this newsletter.

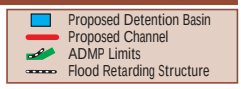
McDowell Road Alternative



Option 1



Option 2



Conceptual Sketch of Landscaped Channel

Advantages/ Disadvantages

- With this alternative in place, future flood damage would be substantially reduced west of Thunder Mountain and south of McDowell Road.
- The presence of a conveyance channel adjacent to McDowell Road will minimize private property acquisition, residential relocated and habitat disturbance.
- This alternative could provide for an east/west trail link from Usery Pass Road/Bush Highway bike route and the Central Arizona Project (CAP) Canal trail.

Goal

Design a drainage option to protect the existing urban developments by means of a system of channels/storm drains and off-line detention basins.

Description

Existing drainage:

- There are no existing or planned drainage conveyance systems in McDowell Road. The only drainage provision consists of small cross drainage culverts on some of the smaller washes.
- McDowell Road does not provide adequate cross drainage for larger flow events, which results in ponding along the north side of McDowell Road and roadway flooding.
- The walls around the Thunder Mountain subdivision are diverting flow around the subdivision and causing it to discharge across Hawes Road at Oak Street and across McDowell Road.
- During major flow events, McDowell Road is overtopped and the residential areas south of McDowell Road experience flooding.
- No natural conveyance corridor exists along the McDowell Road alignment.

Proposed drainage features will:

- Reduce the magnitude of the peak discharges by utilizing strategically placed off-line detention basins.
- Convey the more frequent and/or major discharges along McDowell Road and/or Oak Street.
- Utilize the existing Las Sendas channel paralleling McDowell Road as part of the conveyance system.

Options

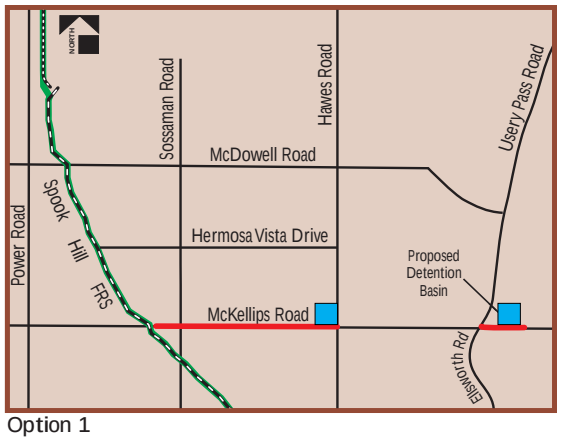
Option 1 - Trapezoidal, earthen channel with vertical drops. Storm drains in Oak Street and McDowell Road. Three detention basins.

Option 2 - Trapezoidal, earthen channel with vertical drops. No storm drain in Oak Street west of Hawes Road. Three detention basins.

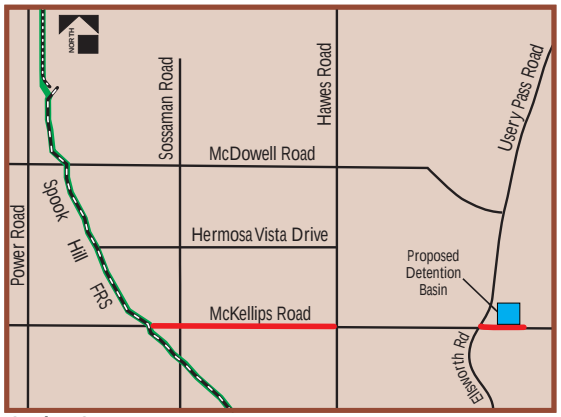
Option 3 - No Action, option.

Option 4 - Non-Structural option.

McKellips Road Alternative

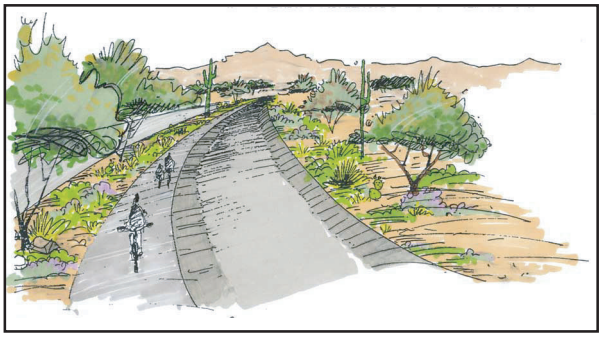


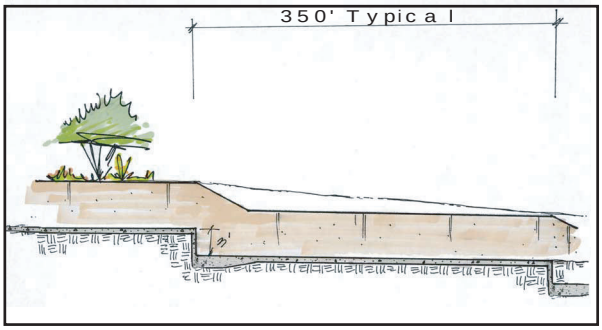
Option 1



Option 2

Proposed Detention Basin
Proposed Channel
ADMP Limits
Flood Retarding Structure


Conceptual Sketch of Option 2



Typical Section Option 2

Goal

Design a drainage option that utilizes McKellips Road as the primary conveyance corridor.

Description

Existing drainage:

- **The area is currently undeveloped and any flooding which is occurring is along McKellips Road or on vacant land and is not resulting in damage to private property.**
- **There are no existing or planned drainage conveyance systems in McKellips Road. The only drainage provision consists of small cross drainage culverts on some of the smaller washes.**
- **McKellips Road does not provide adequate cross drainage, which results in ponding along the north side of McKellips Road and in layer events, overtopping of the road itself. Sediment deposition and erosion also cause increased maintenance problems.**
- **No natural conveyance corridor exists along the McKellips Road alignment.**

Proposed drainage features will:

- **Reduce the magnitude of the peak discharges by utilizing strategically placed off-line detention basins.**
- **Convey the more frequent and/or major discharges along McKellips Road.**

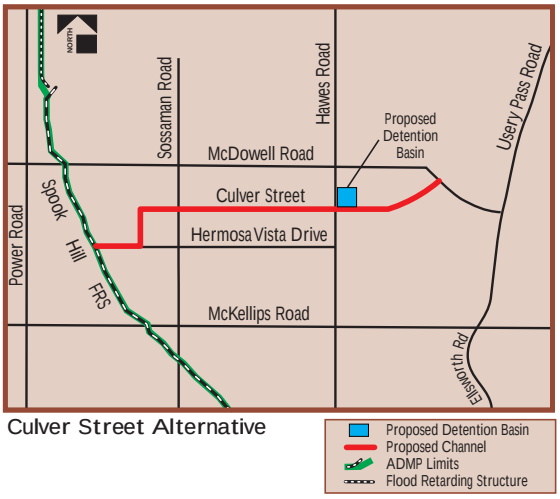
Options

Option 1 - Trapezoidal, earthen channel with vertical drops. Basins at Hawes Road and Ellsworth Road.
Option 2 - Trapezoidal, concrete channel with vertical drops. Basin at the northeast corner of Ellsworth and McKellips roads.
Option 3 - No Action option.
Option 4 - Non-Structural option.

Advantages/ Disadvantages

- **The presence of a conveyance channel adjacent to McKellips Road would minimize private property acquisition, residential relocations, and habitat disturbance.**
- **The construction of a basin along the McKellips Road alignment will provide a multiple-use opportunity, and construction of a channel along McKellips Road may benefit access to Red Mountain District Park.**

Culver Street Alternative



Culver Street Alternative

Goal

Design a drainage option that utilizes Culver Street as the primary conveyance corridor.

Description

Existing drainage:

- **Culver Street has an inverted crown and is acting as a collector channel during both frequent and major storm events.**
- **Culver Street has limited capacity so properties to the south are experiencing flooding on their properties during significant storm events.**
- **There is no existing drainage system in Culver Street.**
- **Culver Street is unpaved; therefore, erosion, sediment, and maintenance problems are significant concerns.**

Proposed drainage features will:

- **Collect the flow in a channel/pipe and convey in to the west along the Culver Street alignment.**
- **Utilize an off-line detention basin at the intersection of Culver Street and Hawes Road to reduce the peak discharge.**


Culver Street


Conceptual Sketch of Detention Basin

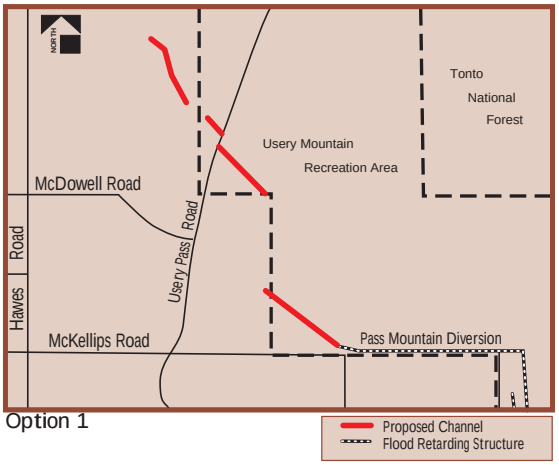
Advantages/ Disadvantages

- **The Culver Street Alternative is independent of the McDowell Road Alternative in that, if a system were constructed in McDowell Road, any system in Culver Street would be largely unnecessary.**
- **The presence of a conveyance channel adjacent to Culver Street will minimize private property acquisition, residential relocations, and habitat disturbed.**
- **The presence of a conveyance channel could provide for an east/west link connecting Usery Pass Road/Bush Highway bike route, Red Mountain District Park, and the Central Arizona Project (CAP) Canal trail.**

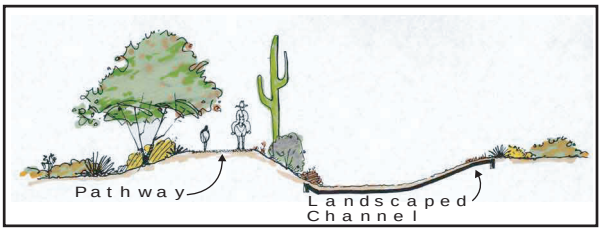
Conclusion

An alternative along the McDowell Road alignment is necessary in order to address the existing drainage problems along the McDowell Road alignment and the downstream areas. A Culver Street Alternative will not serve any useful purpose in conjunction with a McDowell Road alternative. It is recommended that the Culver Street Alternative not be carried forward into the Level II Analysis phase of the study.

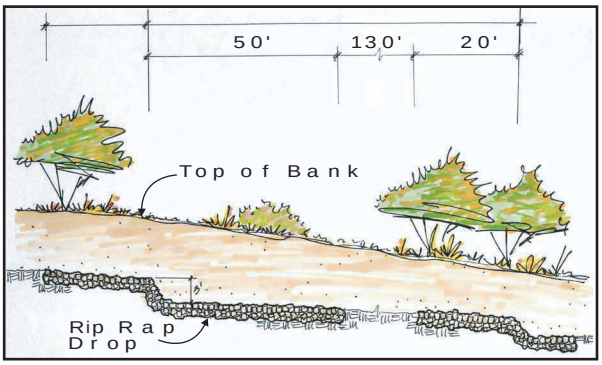
Pass Mountain Diversion Alternative



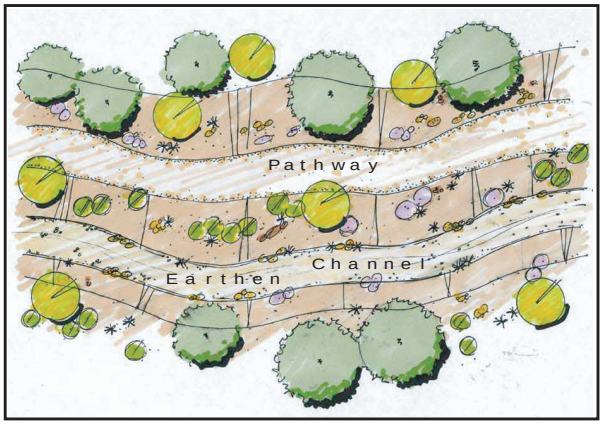
Option 1



Typical Section of Option 1



Typical Section of Option 2



Plan View of Option 2

Goal

Design a drainage option which will divert runoff away from the populated areas upstream of the Spook Hill FRS and into the Signal Butte FRS via a system of berms/channels. This will fully utilize the existing capacity of the Signal Butte FRS.

Description

Existing drainage:

- **The area is currently undeveloped and there are no reported flooding problems.**

Proposed drainage features will:

- **Reduce the magnitude of the peak discharges in the developed areas west of Usery Pass Road by diverting runoff into the Signal Butte FRS.**
- **Fully utilize the existing capacity of the Signal Butte FRS by diverting additional flow across the Pass Mountain Diversion and into the Signal Butte FRS.**

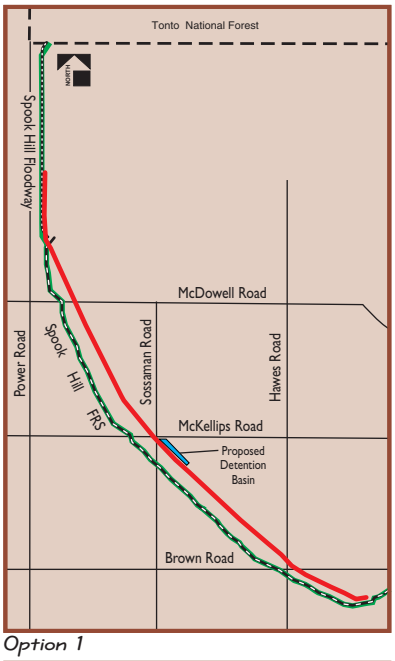
Options

Option 1 - Trapezoidal, earthen channel.
Option 2 - Trapezoidal, earthen channel with vertical drops.
Option 3 - No Action option.
Option 4 - Non-Structural option.

Advantages/ Disadvantages

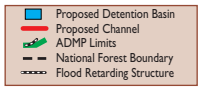
- **This alternative will pass through the Usery Mountain Park.**
- **The construction of a levee/channel through the Usery Mountain Recreation Area will eliminate vegetation and wildlife habitat, and create other environmental concerns.**
- **Potential public controversy.**
- **Park land will be removed from recreational use during construction, but after construction recreational activities will resume.**
- **The required size of the McDowell or McKellips Road Alternatives would be reduced.**

Non-Jurisdictional Alternative



Option 1

Option 2



Goal

Evaluate the benefits to the District in the form of reduced liability, increased safety, and reduced maintenance by removing the jurisdictional status of one or more of the Buckhorn-Mesa Flood Retention Structures.

Description

Option One is a structural alternative/measure that examines the feasibility of converting the Spook Hill FRS into a floodway system. The floodway would convey the 100-year event floodwaters north to discharge to the Salt River instead of detaining/impounding floodwaters behind the Spook Hill FRS. Since floodwater would not be impounded behind the FRS, it would not be subject to ADWR dam safety rules and regulations. The Signal Butte and Apache Junction FRS structures would remain as is, with the addition of an off-line detention basin in the northern portion of the Red Mountain Park golf course facility proposed by the City of Mesa. The capacity of the Spook Hill Floodway would have to be increased (via lining or deepening) to accommodate the resulting discharge increase.

Option Two is similar to Option One, and includes the off-line detention basin in the northern portion of the Red Mountain Park facility, the Pass Mountain Diversion Alternative to divert additional flows into the Signal Butte FRS, and an increased principal spillway outflow at the Signal Butte FRS.

Options

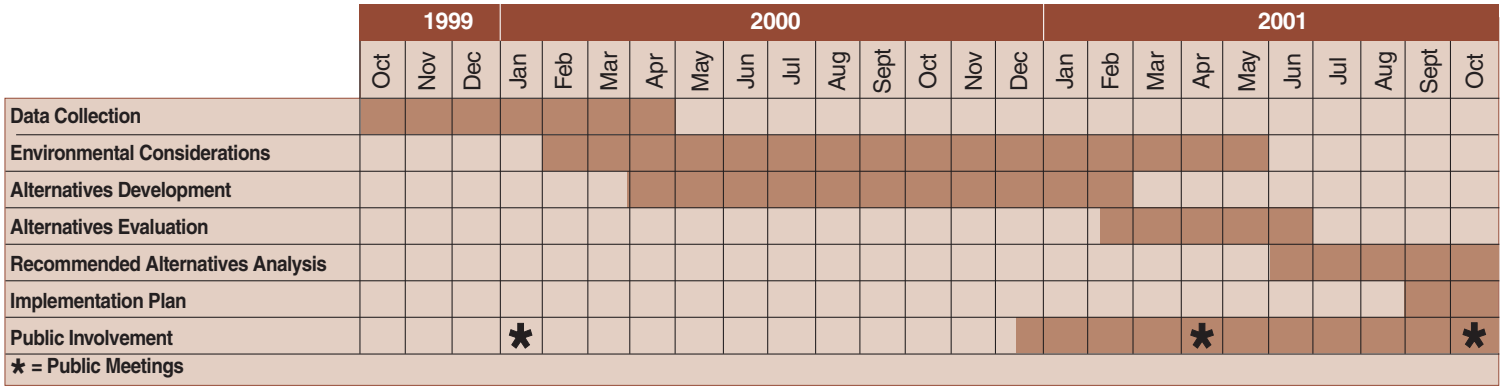
Option 1 - Spook Hill Diversion with off-line basin in Red Mountain Park (off-line basin).
Option 2 - Spook Hill Diversion with off-line basin, Pass Mountain Diversion and quadrupled Signal Butte Principal Spillway outflow curve.
Option 3 - No Action option.
Option 4 - Non-Structural option.

Advantages/ Disadvantages

Option 1 - The Spook Hill Diversion option will reduce the peak discharge in the Spook Hill floodway channel to near 2000-cubic feet per second along its entire length. This will reduce the required channel size from McKellips Road to the north, but the existing Spook Hill Floodway will still have to be modified to handle the increased flow.

Option 2 - This alternative results in a peak discharge in the Spook Hill floodway channel that is less than 2000-cubic feet per second along its entire length. The required channel size from McKellips Road to the north will be reduced, but the existing Spook Hill Floodway will still have to be modified to handle the increased flow. The off-line basin in the Red Mountain Park would be significantly smaller in Option 1.

Study Schedule



Next Steps

The project team will hold a second public open-house to inform the public of the alternatives which are being evaluated for the Spook Hill ADMP Update study area. Input from the project Stakeholders along with input from the second public meeting will be used to revise the alternatives during the Level II (Alternatives Development) Phase of the project.

- ***refine and adjust our drainage concepts;***
- ***fine tune the hydrologic runoff model;***
- ***refine the landscape concepts;***
- ***develop final cost estimates; and***
- ***complete preliminary design plans for the recommended options.***

The Spook Hill ADMP Update study team will be presenting the results of the study and the preferred alternative drainage solutions at our third, and final, public information meeting. For current study information and updates please visit our web page at www.spookhilladmp.com.

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